Date: October 9, 2015

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CC: Don Gronstal, AFCEC; Calvin Cox, CNGS; and Susan Soloyanis, Sologeo

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Subject: Former George AFB - Fall 2015 Basewide Groundwater Sampling Event

The fall 2015 groundwater monitoring event is scheduled to begin October 12, and will include gauging the depth-to-water for all groundwater monitoring and extraction wells and analyzing groundwater samples from selected wells for volatile organic compounds (VOCs), general chemistry, and total dissolved solids (TDS). The methods and analytical suites for groundwater sampling are provided in the Draft UFP QAPP (Shaw, 2012a). The list of monitoring wells to be sampled is provided as Table 1. Note that a summary of this Tech Memo will also be presented at the upcoming annual Fall BCT Meeting.

The overall objectives of this groundwater monitoring event are to:

- Verify compliance with the ROD (OU1)
- Verify plume stability and product distribution in support of the PSCAP (SS030 and ST067b)
- Verify compliance with the LTMP (OT069)
- Monitor seasonal variation in groundwater elevation and flow patterns, and
- Monitor concentrations and areal extent of contaminants of concern (COCs).

There are four sites associated with this Fall 2015 basewide groundwater monitoring event: OT069, SS030, ST067b, and CG070. Per the BCT workshop in August 2014, AMR sampling was to be divided into two separate events: OU1 sampling (Fall) and non-OU1 sampling (Spring); except where specified within RODs/LTMPs. As OT071 and ZZ051 wells were recently sampled during the Spring 2015 event, they were not included in the Fall sample schedule proposed in this Tech Memo. The proposed well sample list (Table 1) was determined by combining the results of a BCT Workshop (August 26th and 27th, 2014), and the rationale provided in the Groundwater Monitoring Decision Tree (Figure 2-1; Shaw 2013) along with an evaluation of historical results or the requirements of a site-specific long-term monitoring plan (LTMP). Table 1 includes the well identification, aquifer, screen depth, previous depth to water, proposed pump placement, associated site(s), analysis to be performed and rationale for sampling in October 2015. Note that some of the wells are used to monitor multiple plumes and the data

collected will be used for reporting on more than one site. This "cross-over" category must be taken into account when calculating the total well count for the proposed Fall 2015 Sampling Event.

OT069 Site OT069 is a chlorinated VOC groundwater plume present in the Upper Aquifer beneath the flight line area that is part of OU3. The LTMP for Site OT069 entails annual sampling to monitor the chlorinated solvent plume. Table 1 identifies the nine (9) dedicated wells to be sampled under OT069; however, as previously mentioned, there are additional wells which are used to monitor multiple site plumes (i.e. OT069, SS030, and ST067b). There are a total of twelve (12) wells in this category for OT069 (nine [9] wells shared with SS030 and three [3] wells shared with ST067b); also identified in Table 1.

SS030. Site SS030 is a non-CERCLA site that contains a freeproduct and a dissolved-phase petroleum hydrocarbon plume present in the Upper Aquifer beneath the flightline area. Monitoring wells associated with the SS030 site will not be sampled for dissolved constituents if free product is observed while gauging the depth-to-water. In addition to groundwater samples, free product will be collected from six (6) SS030 wells to provide data to support the future selected remedy within the PSCAP. Table 1 identifies the twenty-two (22) dedicated wells to be sampled under SS030 along with an additional nine (9) wells shared with OT069. Note that as the nine-shared wells were previously accounted for in the OT069 subsection, they do not count toward the well total.

ST067b. Site ST067b is a non-CERCLA site that contains a free product and a dissolved-phase JP-4 plume present in the Upper Aquifer and is located in the southwestern portion of the Base. Monitoring wells associated with the ST067b site will not be sampled for dissolved constituents if free product is observed while gauging the depth-to-water. Table 1 identifies thirty-two (32) dedicated wells to be sampled under ST067b, plus an additional three (3) wells shared with OT069. Note that as the three-shared wells were previously accounted for in the OT069 subsection, they do not count toward the well total.

CG070. Site CG070 consists of a TCE groundwater plume present in the Upper and Lower Aquifers in the northeastern portion of the former George AFB and is part of OU1. Figures 1 and 2 identify the wells that will be sampled for VOCs in October 2015 in the Upper and Lower Aquifers, respectively. Groundwater samples will be collected from a total of 89 CG070 wells. Analysis will include VOCs for all 89 wells and geochemical parameters for select wells (see Table 1).

Fall 2015 Variations. Basewide locations that were sampled in October 2014, but will not be sampled in October 2015, are listed below:

SS030

- MW-13
- MW-42
- MW-47
- MW-99
- MW-111
- MW-115

OT069

- MW-88

These seven (7) non-OU1 wells were recently sampled during the Spring 2015 groundwater event per the BCT Workshop in August 2014. As such, they are now part of the Spring sampling rotation and no longer included in the Fall rotation.

Conclusion. In summary, a total of 157 wells (as shown in Table 1) will be sampled during the upcoming October 2015 basewide groundwater monitoring event. Groundwater sample analysis will include 151 VOC samples, 12 cation samples, 12 TDS samples, 91 chloride samples, 50 nitrate samples, 34 sulfate samples, 46 alkalinity samples, 90 field test samples, zero (0) dieldrin samples, and corresponding QA samples (Table 1). The six product samples will be analyzed for specific gravity, carbon chain analysis, and viscosity. All of the wells will be gauged for depth-to-water or depth-to-product. Gauging and groundwater monitoring will be performed in accordance with the Draft UFP-QAPP (Shaw, 2012a). Sampling results from the October 2015 groundwater monitoring event will be reported in the 2015 Basewide Annual Monitoring and Operations Report for CERCLA and Non-CERCLA Sites.

Tables

Table 1 – Monitoring Well Summary, October 2015 Basewide Groundwater Monitoring Event

Figures

Figure 1 – Upper Aquifer Wells to be Sampled, October 2015

Figure 2 – Lower Aquifer Wells to be Sampled, October 2015

References

MWH, 2011, ***Final 2010 Basewide Annual Monitoring and Operations Report for CERCLA and Non-CERCLA Sites, George Air Force Base, California,*** August.

MWH, 2012, ***Final 2011 Basewide Annual Monitoring and Operations Report for CERCLA and Non-CERCLA Sites, George Air Force Base, California,*** August.

Shaw, 2013, ***Final 2012 Basewide Annual Monitoring and Operations Report for CERCLA and Non-CERCLA Sites, George Air Force Base, California,*** May.

Shaw, 2012a, ***Draft Uniform Federal Policy (UFP) Quality Assurance Project Plan (QAPP) Quality Program Plan – Volume 1, Former George Air Force Base, Victorville, California,*** August.

Table 1

Monitoring Well Summary
Fall 2015 Basewide Groundwater Monitoring Event
Former George Air Force Base, California

Monitoring Well	Aquifer	Screen (ft bgs)	Oct 2014 DTW (ft btoc)	Proposed Pump Placement	Associated Site	VOCs	Cations	TDS	Chloride	Nitrate	Sulfate	Alkalinity	Field Test	Dieldrin	Rationale
Retained from Last Fall Event (2014)															
EW-6	L	160-230	183.5	middle of column	CG070	•									OU-1 well scheduled for Fall sampling per BCT Workshop held in August 2014; transmissive zone with highest contaminant concentrations or hydraulic conductivity
FT-03	U	133-168	116.72	138 ft btoc	CG070	•			•				•		OU-1 source area well scheduled for Fall sampling per BCT Workshop held in August 2014; confirms decay curve
FT-04	U	134-169	118.42	middle of column	CG070	•			•				•		OU-1 source area well scheduled for Fall sampling per BCT Workshop held in August 2014; confirms decay curve
FT-05	U	117-127	117.89	middle of column	CG070	•			•				•		OU-1 source area well scheduled for Fall sampling per BCT Workshop held in August 2014; confirms decay curve
LW-1	L	64-103	48.82	middle of column	CG070	•									OU-1 well scheduled for Fall sampling per BCT Workshop held in August 2014; plume boundary/compliance boundary; area representative of contaminated and uncontaminated geochemical settings
LW-3	L	40-60	13.9	45 ft btoc	CG070	•									OU-1 well scheduled for Fall sampling per BCT Workshop held in August 2014; plume boundary/compliance boundary
MW-30	U	120-160	127.92	5 ft below water table	OT069/SS030	•									Non OU-1 well; SS030 PSCAP compliance well
MW-31	U	120-160	123.25	5 ft below water table	OT069/SS030	•									Non OU-1 well; SS030 PSCAP compliance well
MW-34	U	120-160	126.29	5 ft below water table	OT069/SS030	•									Non OU-1 well; SS030 PSCAP compliance well
MW-37	L	270-310	258.11*	middle of column	CG070	•									OU-1 well scheduled for Fall sampling per BCT Workshop held in August 2014; plume boundary/compliance boundary
MW-43	U	118-158	131.51	5 ft below water table	OT069/SS030	•									Non OU-1 well; SS030 PSCAP compliance well; OT069 LTMP well
MW-45	U	120-160	121.7	5 ft below water table	OT069	•									Monitor within SS030 benzene plume, also OT069 LTMP well; SS030 PSCAP compliance well
MW-48	U	120-160	135.28	middle of column	OT069	•									Non OU-1 well; OT069 LTMP well; formerly sampled during Spring event only; recommended for semi-annual sampling as it is the closest downgradient well to the SS083 source area.
MW-58	U	120-160	128.82	5ft below water table	OT069	•									Monitor eastern perimeter of SS030 benzene plume; OT069 LTMP well, annual sampling; SS030 PSCAP compliance well
MW-71	U	120-160	125.09	5ft below water table	OT069	•									Monitor northeast of SS084 MTBE and SS030 benzene plumes; OT069 LTMP well, annual sampling; SS030 PSCAP compliance well
MW-74	U	153-158	135.91	middle of water	OT069	•									Non OU-1 well; OT069 LTMP well, annual sampling
MW-75	U	121-161	135.31	5ft below water table	OT069	•									Non OU-1 well; OT069 LTMP well, annual sampling
MW-91	U	117-132	128.01	5ft below water table	OT069/SS030	•									Non OU-1 well; OT069 LTMP well, annual sampling
MW-102-OU1	U	155-175	131.26	middle of column	CG070	•			•				•		OU-1 source area well scheduled for Fall sampling per BCT Workshop held in August 2014; confirms decay curve
MW-103-OU1	U	110-134	119.62	middle of column	CG070	•			•				•		OU-1 well scheduled for Fall sampling per BCT Workshop held in August 2014; areas representative of contaminated and uncontaminated geochemical settings
MW-105	U	114-134	104.88	119 ft btoc	CG070	•	•	•	•	•		•	•		OU-1 well scheduled for Fall sampling per BCT Workshop held in August 2014; representative of contaminated and uncontaminated geochemical setting; supports the monitoring of site hydrology; general chemistry sample to assess movement from the upper to the lower aquifer
MW-116***	U	140-160	145.37	5 ft below water table	ST067b	•			•	•	•	•	•		ST067b PSCAP compliance well; free product previously detected in well
MW-117	U	140-160	143.54	5 ft below water table	ST067b	•			•	•	•	•	•		Monitor benzene concentrations with ST067b plume; ST067b PSCAP compliance well
MW-118***	U	140-160	143.37*	middle of column	ST067b	•			•	•	•	•	•		ST067b PSCAP compliance well; free product previously detected in well
MW-119***	U	140-160	147.67*	5 ft below water table	ST067b	•			•	•	•	•	•		ST067b PSCAP compliance well; free product previously detected in well
MW-120***	U	145-165	151.27	5 ft below water table	ST067b	•			•	•	•	•	•		ST067b PSCAP compliance well; free product previously detected in well
MW-121	U	132-152	140.34	5 ft below water table	ST067b	•			•	•	•	•	•		Monitor upgradient of the ST067b benzene plume; ST067b PSCAP compliance well
MW-123	U	146-161	153.34	5 ft below water table	ST067b	•			•	•	•	•	•		Monitor downgradient of ST067b benzene plume; ST067b PSCAP compliance well
MW-124	U	135-155	143.8	5 ft below water table	ST067b	•			•	•	•	•	•		Monitor downgradient of ST067b benzene plume; ST067b PSCAP compliance well
MW-125	U	143.5-163.5	156.91	5 ft below water table	ST067b	•			•	•	•	•	•		Non OU-1 well; ST067b PSCAP compliance well
MW-126***	U	142-162	145.8	middle of column	ST067b	•			•	•	•	•	•		ST067b PSCAP compliance well; free product previously detected in well
MW-127***	U	140.5-165.5	148.78	5 ft below water table	ST067b	•			•	•	•	•	•		ST067b PSCAP compliance well; free product previously detected in well
MW-128***	U	145-165	154.82	5 ft below water table	ST067b	•			•	•	•	•	•		ST067b PSCAP compliance well; free product previously detected in well
MW-129	U	142-157	142.61	middle of column	ST067b	•			•	•	•	•	•		Non OU-1 well; ST067b PSCAP compliance well
MW-130	U	146-161	153	5 ft below water table	ST067b	•			•	•	•	•	•		Non OU-1 well; ST067b PSCAP compliance well
MW-131	U	157-172	162.86	5 ft below water table	ST067b	•			•	•	•	•	•		Monitor southeastern extent of ST067b benzene plume; ST067b PSCAP compliance well
MW-132	U	154-169	159.73	5 ft below water table	ST067b	•			•	•	•	•	•		Monitor benzene concentrations with ST067b plume; ST067b PSCAP compliance well
MW-133	U	140-155	140.25	5 ft below water table	ST067b/OT069	•			•	•	•	•	•		Monitor downgradient of ST067b plume; ST067b PSCAP compliance well; OT069 LTMP well
MW-134	U	145-160	144.49	5ft below water table	ST067b	•			•	•	•	•	•		Monitor southwestern extent of ST067b benzene plume; ST067b PSCAP compliance well
MW-136	U	155-170	156.82	middle of column	ST067b	•			•	•	•	•	•		Monitor downgradient edge of Upper Aquifer dieldrin plume; ST067b PSCAP compliance well
MW-137	U	160-185	168.22	middle of water	ST067b	•			•	•	•	•	•		Non OU-1 well; ST067b PSCAP compliance well
MW-138	U	137-152	142.23	5ft below water table	ST067b	•			•	•	•	•	•		Non OU-1 well; ST067b PSCAP compliance well
MW-139***	U	148-161	149.82	middle of column	ST067b	•			•	•	•	•	•		Non OU-1 well; free product previously detected in well
MW-140***	U	148-168	154.26	5ft below water table	ST067b	•			•	•	•	•	•		Non OU-1 well; free product previously detected in well
MW-141	U	115-135	125.75	5 ft below water table	OT069	•				•					OT069 LTMP well, annual sampling; ST067b PSCAP compliance well
MW-142	L	310-340	305.91	5ft below water table	ST067b	•			•	•	•	•	•		Non OU-1 well; ST067b PSCAP compliance well
MW-143	L	280-310	305.3	middle of column	ST067b	•			•	•	•	•	•		Monitor vertical migration of ST067b benzene plume; Monitor dieldrin concentrations within Lower Aquifer OT071 plume; ST067b PSCAP compliance well
MW-144	U	143-163	148.95	middle of column	ST067b/OT069	•			•	•	•	•	•		Clean well between ST067b and OT071 plumes; ST067b PSCAP compliance well
MW-151	L	275-305	298.14	middle of column	ST067b	•			•	•	•	•	•		ST067b PSCAP compliance well
MW-153	U	153-173	162.58	middle of column	ST067b	•			•	•	•	•	•		New well; Non OU-1 well; ST067b PSCAP compliance well
MW-154	U	156-176	178.72	middle of column	ST067b	•			•	•	•	•	•		New well; Non OU-1 well; ST067b PSCAP compliance well
MW-155	U	157.5-187.5	184.71	middle of column	ST067b	•			•	•	•	•	•		New well; Non OU-1 well; ST067b PSCAP compliance well
MW-157	U	179-189	188.17	middle of column	ST067b	•			•	•	•	•	•		New well; Non OU-1 well; ST067b PSCAP compliance well
MW-158	U	160-180	172.51	middle of column	ST067b	•			•	•	•	•	•		New well; Non OU-1 well; ST067b PSCAP compliance well
NZ-03	L	130-150	127.52	middle of column	CG070	•									OU-1 well scheduled for Fall sampling per BCT Workshop held in August 2014; area representative of contaminated and uncontaminated geochemical settings
NZ-06	U	138-158	113.7	143 ft btoc	CG070	•			•				•		OU-1 well scheduled for Fall sampling per BCT Workshop held in August 2014; areas representative of contaminated and uncontaminated geochemical settings; confirms decay curve
NZ-07	U	100-130	86.78	middle of column	CG070	•			•				•		OU-1 well scheduled for Fall sampling per BCT Workshop held in August 2014; confirms decay curve
NZ-11	U	115-145	111.82	5 ft below water table	CG070	•			•				•		OU-1 well scheduled for Fall sampling per BCT Workshop held in August 2014; confirms decay curve
NZ-12	U	120-150	109.96	middle of column	CG070	•			•				•		OU-1 well scheduled for Fall sampling per BCT Workshop held in August 2014; confirms decay curve
NZ-13	L	155-185	147.74	middle of column	CG070	•	•	•	•	•		•	•		LTMP annual monitorng; plume boundary/compliance boundary category; general chemistry sample to assess movement from the upper to the lower aquifer
NZ-18	U	122-132	120.9	middle of column	CG070	•			•				•		OU-1 well scheduled for Fall sampling per BCT Workshop held in August 2014; plume boundary/compliance boundary
NZ-20	U	151-161	139.46	156 ft btoc	CG070	•	•	•	•	•		•	•		OU-1 well scheduled for Fall sampling per BCT Workshop held in August 2014; recalcitrant zone; confirms decay curve; general chemistry sample to assess movement from the upper to the lower aquifer
NZ-21	U	100-115	92.83	105 ft btoc	CG070	•			•				•		OU-1 well scheduled for Fall sampling per BCT Workshop held in August 2014; plume boundary/compliance boundary category; general chemistry sample to assess movement from the upper to the lower aquifer
NZ-22	U	131-141	94.99	135 ft btoc	CG070	•			•				•		OU-1 well scheduled for Fall sampling per BCT Workshop held in August 2014; confirms decay curve
NZ-23	U	135-145	116.97	140 ft btoc	CG070	•			•				•		OU-1 well scheduled for Fall sampling per BCT Workshop held in August 2014; confirms decay curve
NZ-24	U	130-140	112.02	135 ft btoc	CG070	•			•				•		OU-1 well scheduled for Fall sampling per BCT Workshop held in August 2014; confirms decay curve
NZ-25	U	110-120	91.8	115 ft btoc	CG070	•			•				•		OU-1 well scheduled for Fall sampling per BCT Workshop held in August 2014; supports monitoring of site hydrology; confirms decay curve

Table 1

Monitoring Well Summary
Fall 2015 Basewide Groundwater Monitoring Event
Former George Air Force Base, California

Monitoring Well	Aquifer	Screen (ft bgs)	Oct 2014 DTW (ft btoc)	Proposed Pump Placement	Associated Site	VOCs	Cations	TDS	Chloride	Nitrate	Sulfate	Alkalinity	Field Test	Dieldrin	Rationale
NZ-27	U	77-87	61.15	82 ft btoc	CG070	•									OU-1 well scheduled for Fall sampling per BCT Workshop held in August 2014; areas representative of contaminated/uncontaminated geochemical settings; confirms decay curve
NZ-28A	U	57-87	59	middle of column	CG070	•			•				•		OU-1 well scheduled for Fall sampling per BCT Workshop held in August 2014; supports the monitoring of site hydrology
NZ-30	U	150-160	159.76*		CG070	•									OU-1 well scheduled for Fall sampling per BCT Workshop held in August 2014; confirms decay curve
NZ-31	U	145-155	147.61	middle of column	CG070	•									OU-1 well scheduled for Fall sampling per BCT Workshop held in August 2014; transmissive zone with highest contaminant concentrations or hydraulic conductivity
NZ-32	U	116-136	103.84	121 ft btoc	CG070	•									OU-1 well scheduled for Fall sampling per BCT Workshop held in August 2014; transmissive zone with highest contaminant concentrations or hydraulic conductivity; confirms decay curve; general chemistry sample to assess movement from the upper to lover aquifer
NZ-33	U	155-165	121.13	middle of column	CG070	•									OU-1 source area well scheduled for Fall sampling per BCT Workshop held in August 2014; areas representative of contaminated and uncontaminated geochemical settings
NZ-34	U	92-102	96.86	middle of column	CG070	•			•				•		OU-1 well scheduled for Fall sampling per BCT Workshop held in August 2014; confirms decay curve
NZ-35	U	105-115	95.63	110 ft btoc	CG070	•			•				•		OU-1 well scheduled for Fall sampling per BCT Workshop held in August 2014; areas representative of contaminated and uncontaminated geochemical settings
NZ-36	U	120-130	106.04	125 ft btoc	CG070	•			•				•		OU-1 well scheduled for Fall sampling per BCT Workshop held in August 2014; transmissive zone with highest contaminant concentrations or hydraulic conductivity; confirms decay curve
NZ-37	L	132-142	107.52	137 ft btoc	CG070	•			•				•		OU-1 well scheduled for Fall sampling per BCT Workshop held in August 2014; plume boundary/compliance boundary
NZ-39	U	116-136	109.6	middle of column	CG070	•									OU-1 well scheduled for Fall sampling per BCT Workshop held in August 2014; transmissive zone with highest contaminant concentrations or hydraulic conductivity; confirms decay curve
NZ-41	L	110-125	76.95	115 ft btoc	CG070	•									OU-1 well scheduled for Fall sampling per BCT Workshop held in August 2014; plume boundary/compliance boundary
NZ-43	U	127-157	115.21	middle of column	CG070	•			•				•		OU-1 well scheduled for Fall sampling per BCT Workshop held in August 2014; transmissive zone with highest contaminant concentrations or hydraulic conductivity; confirms decay curve
NZ-44	L	252-273	221.16	257 ft btoc	CG070	•	•	•	•	•		•	•		OU-1 well scheduled for Fall sampling per BCT Workshop held in August 2014; plume boundary/compliance boundary
NZ-48	L	140-160	109.29	45 ft btoc	CG070	•			•				•		OU-1 well scheduled for Fall sampling per BCT Workshop held in August 2014; plume boundary/compliance boundary; area representative of contaminated and uncontaminated geochemical settings
NZ-49	U	117-137	111.05	middle of column	CG070	•			•				•		OU-1 well scheduled for Fall sampling per BCT Workshop held in August 2014; plume boundary/compliance boundary category
NZ-50	L	235-275	208.85*	middle of column	CG070	•			•				•		OU-1 well scheduled for Fall sampling per BCT Workshop held in August 2014; plume boundary/compliance boundary
NZ-51	U	131-152	140.5	middle of column	CG070	•			•	•			•		OU-1 well scheduled for Fall sampling per BCT Workshop held in August 2014; plume boundary/compliance boundary category
NZ-52	U	142-162	154.04	middle of column	CG070	•			•	•			•		OU-1 well scheduled for Fall sampling per BCT Workshop held in August 2014; plume boundary/compliance boundary category
NZ-54	U	125-145	130.83	middle of column	CG070	•			•				•		OU-1 well scheduled for Fall sampling per BCT Workshop held in August 2014; areas representative of contaminated and uncontaminated geochemical settings
NZ-55	U	108-128	NA	middle of column	CG070	•			•				•		OU-1 well scheduled for Fall sampling per BCT Workshop held in August 2014; confirms decay curve; dedicated pump in well
NZ-56	U	111-131	121.5	middle of column	CG070	•			•				•		OU-1 well scheduled for Fall sampling per BCT Workshop held in August 2014; confirms decay curve
NZ-57	L	102-122	97.02	middle of column	CG070	•									OU-1 well scheduled for Fall sampling per BCT Workshop held in August 2014; area representative of contaminated and uncontaminated geochemical settings
NZ-58	L	142-163	139.21	middle of column	CG070	•									LTMP annual monitoring; plume boundary/compliance boundary
NZ-67	U	65-86	71.85	middle of column	CG070	•									OU-1 well scheduled for Fall sampling per BCT Workshop held in August 2014; plume boundary/compliance boundary category
NZ-68	U	122-142	132.92	middle of column	CG070	•			•				•		OU-1 well scheduled for Fall sampling per BCT Workshop held in August 2014; plume boundary/compliance boundary category
NZ-69	L	132-152	119	middle of column	CG070	•			•				•		OU-1 well scheduled for Fall sampling per BCT Workshop held in August 2014; area representative of contaminated and uncontaminated geochemical settings
NZ-72	L	200-220	198.69	middle of column	CG070	•									OU-1 well scheduled for Fall sampling per BCT Workshop held in August 2014; plume boundary/compliance boundary
NZ-76	L	136-156	95.64	141 ft btoc	CG070	•			•				•		OU-1 well scheduled for Fall sampling per BCT Workshop held in August 2014; plume boundary/compliance boundary; area representative of contaminated and uncontaminated geochemical settings
NZ-77	FPA	68-88	32.47	76 ft btoc	CG070	•									OU-1 well scheduled for Fall sampling per BCT Workshop held in August 2014; plume boundary/compliance boundary
NZ-80	L	258-278	245.53	middle of column	CG070	•			•	•			•		LTMP monitoring for the landfill, to be sampled in Fall too; transmissive zone with highest contaminant concentrations or hydraulic conductivity; general chemistry sample to assess movement from the upper to the lower aquifer
NZ-81	U	143-158	157.89	middle of column	CG070	•			•				•		OU-1 well scheduled for Fall sampling per BCT Workshop held in August 2014; plume boundary/compliance boundary category; confirms decay curve
NZ-82	U	107-122	dedicated pump	dedicated pump	CG070	•	•	•	•	•		•	•		OU-1 well scheduled for Fall sampling per BCT Workshop held in August 2014; areas representative of contaminated and uncontaminated geochemical settings; general chemistry sample to assess movement from the upper to the lower aquifer; dedicated pump in well
NZ-83	U	112-124	dedicated pump	dedicated pump	CG070	•			•				•		OU-1 well scheduled for Fall sampling per BCT Workshop held in August 2014; areas representative of contaminated and uncontaminated geochemical settings; dedicated pump in well
NZ-84	L	241-256	232.62	middle of column	CG070	•									OU-1 well scheduled for Fall sampling per BCT Workshop held in August 2014; transmissive zone with highest contaminant concentrations or hydraulic conductivity; general chemistry sample to assess movement from the upper to the lower aquifer
NZ-85	L	190-205	172.91	195 ft btoc	CG070	•	•	•	•	•		•	•		OU-1 well scheduled for Fall sampling per BCT Workshop held in August 2014; plume boundary/compliance boundary
NZ-93	U	115-135	121.71	middle of column	CG070	•									OU-1 well scheduled for Fall sampling per BCT Workshop held in August 2014; transmissive zone with highest contaminant concentrations or hydraulic conductivity; supports the monitoring of site hydrology
NZ-97	U	97-117	108.72	middle of column	CG070	•									OU-1 well moved to Fall sampling schedule per BCT Workshop held in August 2014; plume boundary/compliance boundary category; supports monitoring of site hydrology
NZ-98	L	226-246	216.82*	231 ft btoc	CG070	•									OU-1 well scheduled for Fall sampling per BCT Workshop held in August 2014; plume boundary/compliance boundary
NZ-99	U	96-116	107.26	middle of column	CG070	•			•				•		OU-1 well moved to Fall sampling schedule per BCT Workshop held in August 2014; distal/fringe portion of plume; supports monitoring of site hydrology
NZ-101	U	91-111	103.2	5 ft below water table	CG070	•			•				•		OU-1 well scheduled for Fall sampling per BCT Workshop held in August 2014; plume boundary/compliance boundary category
NZ-102	U	96-116	103.72	5 ft below water table	CG070	•									OU-1 well scheduled for Fall sampling per BCT Workshop held in August 2014; transmissive zone with highest contaminant concentrations or hydraulic conductivity; confirms decay curve
NZ-103	U	57-77	45.3	middle of column	CG070	•			•				•		OU-1 well scheduled for Fall sampling per BCT Workshop held in August 2014; supports monitoring of site hydrology; confirms decay curve
NZ-104	L	117-137	101.42	middle of column	CG070	•									OU-1 well scheduled for Fall sampling per BCT Workshop held in August 2014; plume boundary/compliance boundary
NZ-105R	L	170-190	158.53	middle of column	CG070	•			•				•		OU-1 well scheduled for Fall sampling per BCT Workshop held in August 2014; area representative of contaminated and uncontaminated geochemical settings
NZ-106	L	210-230	202.74	middle of column	CG070	•	•	•	•	•		•	•		OU-1 well scheduled for Fall sampling per BCT Workshop held in August 2014; distal/fringe portions of the plume; area representative of contaminated and uncontaminated geochemical settings
NZ-107	L	260-280	251.16	middle of column	CG070	•	•	•	•	•		•	•		LTMP monitoring for the landfill (only applies to Spring sampling), to be sampled in Fall too; transmissive zone with highest contaminant concentrations or hydraulic conductivity; general chemistry sample to assess movement from the upper to the lower aquifer
NZ-111	U	100-140	116.35	5 ft below water table	CG070	•			•				•		OU-1 well scheduled for Fall sampling per BCT Workshop held in August 2014; areas representative of contaminated/uncontaminated geochemical settings; confirms decay curve
NZ-112	L	180-200	173.42	middle of column	CG070	•									LTMP monitoring for the landfill (only applies to Spring sampling), to be sampled in Fall too; plume boundary/compliance boundary
NZ-113	L	133-153	127.02	middle of column	CG070	•			•				•		LTMP monitoring for the landfill (only applies to Spring sampling), to be sampled in Fall too; plume boundary/compliance boundary
NZ-116	U	120-140	130.52	5 ft below water table	CG070	•									OU-1 well scheduled for Fall sampling per BCT Workshop held in August 2014; confirms decay curve
NZ-119	U	148-168	166.82	5ft below water table	ST067b	•			•	•	•	•	•		ST067b PSCAP compliance well
NZ-126	U	115-135	107.78	middle of column	CG070	•									OU-1 well scheduled for Fall sampling per BCT Workshop held in August 2014; transmissive zone with highest contaminant concentrations or hydraulic conductivity
NZ-127b	L	290-310	251.42*	300 ft btoc	CG070	•			•				•		OU-1 well scheduled for Fall sampling per BCT Workshop held in August 2014; plume boundary/compliance boundary
NZ-127c	L	340-360	251.32*	350 ft btoc	CG070	•									OU-1 well scheduled for Fall sampling per BCT Workshop held in August 2014; plume boundary/compliance boundary
NZ-129b	L	290-310	232.72	302 ft btoc	CG070	•									OU-1 well scheduled for Fall sampling per BCT Workshop held in August 2014; area representative of contaminated and uncontaminated geochemical settings
NZ-129c	L	320-340	232.11*	332 ft btoc	CG070	•			•						OU-1 well scheduled for Fall sampling per BCT Workshop held in August 2014; area representative of contaminated and uncontaminated geochemical settings
NZ-130a	L	155-175	155.72	168 ft btoc	CG070	•	•	•	•	•		•	•		OU-1 well scheduled for Fall sampling per BCT Workshop held in August 2014; plume boundary/compliance boundary category; general chemistry sample to assess movement from the
NZ-133b	FPA	65-85	14.3	76 ft btoc	CG070	•									OU-1 well scheduled for Fall sampling per BCT Workshop held in August 2014; plume boundary/compliance boundary
NZ-138	L	130-150	136.95	middle of column	CG070	•	•	•	•	•		•	•		OU-1 well scheduled for Fall sampling per BCT Workshop held in August 2014; transmissive zone with highest contaminant concentrations or hydraulic conductivity; supports monitoring of site hydrology; general chemistry sample to assess movement from the upper to the lower aquifer

Table 1

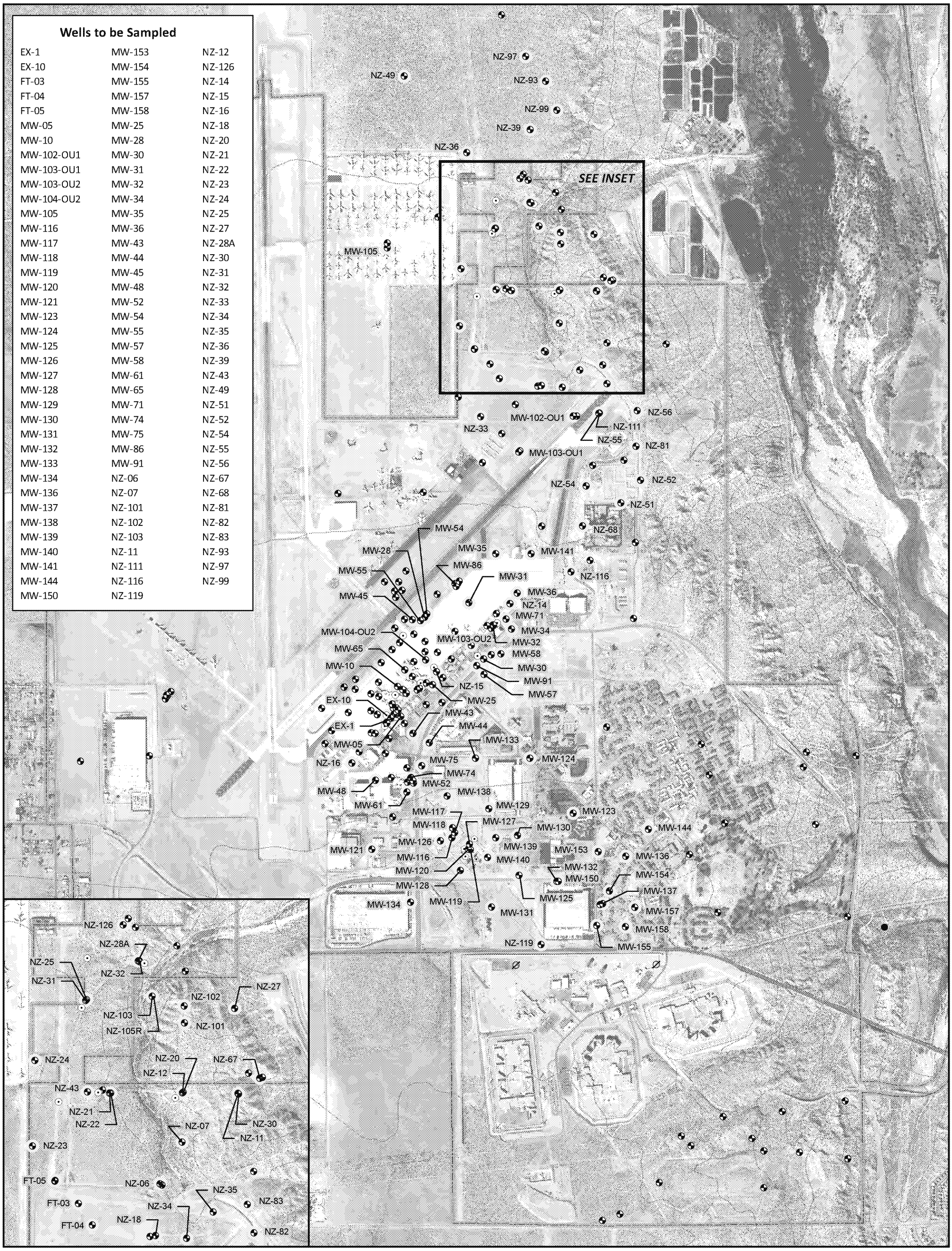
Monitoring Well Summary
Fall 2015 Basewide Groundwater Monitoring Event
Former George Air Force Base, California

Monitoring Well	Aquifer	Screen (ft bgs)	Oct 2014 DTW (ft btoc)	Proposed Pump Placement	Associated Site	VOCs	Cations	TDS	Chloride	Nitrate	Sulfate	Alkalinity	Field Test	Dieldrin	Rationale
NZ-139	L	130-150	139.98	middle of column	CG070	•	•	•	•	•		•	•		OU-1 well scheduled for Fall sampling per BCT Workshop held in August 2014; transmissive zone with highest contaminant concentrations or hydraulic conductivity; supports monitoring of site hydrology; general chemistry sample to assess movement from the upper to the lower aquifer
NZ-140	FPA	2-12	3.29	middle of column	CG070	•	•	•	•	•		•	•		OU-1 well scheduled for Fall sampling per BCT Workshop held in August 2014; plume boundary/compliance boundary; supports monitoring of site hydrology; general chemistry sample to assess movement from the upper to the lower aquifer
OW-1	FPA	34-26	12.36	39 ft btoc	CG070	•			•				•		OU-1 well scheduled for Fall sampling per BCT Workshop held in August 2014; plume boundary/compliance boundary
OW-6	FPA	12-28	4.37	middle of column	CG070	•			•				•		OU-1 well moved to Fall sampling schedule per BCT Workshop held in August 2014
RZ-02	L	310-330	246.32*	315 ft btoc	CG070	•									OU-1 well scheduled for Fall sampling per BCT Workshop held in August 2014; plume boundary/compliance boundary; unknown obstruction in well during Fall 2014 sampling event
EX-01	U	120-165	128.5	5 ft below water table	SS030	•									Evaluate benzene concentrations on the flow path downgradient from ST057 SVE extraction wells
EX-10	U	125-140	127.5	5 ft below water table	SS030	•									Evaluate benzene concentrations on the flow path downgradient from ST057 SVE extraction wells
LW-4	FPA	40-100	50.63	middle of column	CG070	•									OU-1 well moved to Fall sampling schedule per BCT Workshop held in August 2014
MW-61	U	120-160	137.98	5 ft below water table	OT069/ST067b	•									Monitor VOC concentrations at the northern perimeter of the dissolved-phase plume
MW-28	U	120-160	121.40*	5 ft below water table	OT069/SS030	•									LTMP trigger well with model-predicted TCE concentrations
MW-35	U	115-155	120.45	5 ft below water table	OT069/SS030	•									LTMP trigger well with model-predicted TCE concentrations
MW-36	U	120-160	125.11	5 ft below water table	OT069/SS030	•									LTMP trigger well with model-predicted TCE concentrations
MW-44	U	120-160	134.02	5 ft below water table	OT069	•									LTMP trigger well with model-predicted TCE concentrations
MW-52	U	190.5 - 200.5	146	195 ft btoc	SS030	•									Indirect assessment of potential VOC impacts to Lower Aquifer
MW-54	U	185 - 195	127.12	190 ft btoc	SS030	•									Indirect assessment of potential VOC impacts to Lower Aquifer
MW-55	U	165 - 175	122.11	170 ft btoc	SS030	•									Indirect assessment of potential VOC impacts to Lower Aquifer
MW-57	U	120-160	130.24**	5 ft below water table	OT069/SS030	•									LTMP trigger well with model-predicted TCE concentrations
MW-65	U	168 - 178	126.41	172 ft btoc	SS030	•									Indirect assessment of potential VOC impacts to Lower Aquifer
MW-86	U	160 -190	124.44	170 ft btoc	SS030	•									Indirect assessment of potential VOC impacts to Lower Aquifer
MW-150	U	155.5-175.5	161.35*	5 ft below water table	ST067b	•			•	•	•	•	•		High benzene concentration detected in April 2014
NZ-14	U	150-180	127.73	165 ft btoc	SS030	•									Indirect assessment of potential VOC impacts to Lower Aquifer
NZ-15	U	152-182	131.09	167 ft btoc	SS030	•									Indirect assessment of potential VOC impacts to Lower Aquifer
NZ-16	U	150-180	131.28	165 ft btoc	SS030	•									Indirect assessment of potential VOC impacts to Lower Aquifer
NZ-100	L	160-180	136.48	156 ft btoc	CG070	•									OU-1 well to be sampled during Fall 2015 as a 1 time event, plume boundary/compliance boundary
MW-05	U	115-145	130.65	5 ft below water table	SS030										Product sampling
MW-10	U	121-151	128.25	5 ft below water table	SS030										Product sampling
MW-25	U	120-160	128.77	5 ft below water table	SS030										Product sampling
MW-32	U	120-160	126.66	5 ft below water table	SS030										Product sampling
MW-103-OU2	U	119-134	127.43	5 ft below water table	SS030										Product sampling
MW-104-OU2	U	114-134	132.13	~132.5 ft btoc	SS030										Product sampling
Wells Removed/Moved from Fall 2015 Sampling Event															
MW-13	U	120-160		5 ft below water table	SS030	•									Non OU-1 well; all non OU-1 wells moved from Fall to Spring sampling schedule per BCT Workshop in August 2014; SS030 PSCAP compliance well; Sampled in Spring 2015
MW-42	U	120-160		5 ft below water table	SS030	•									Non OU-1 well; all non OU-1 wells moved from Fall to Spring sampling schedule per BCT Workshop in August 2014; SS030 PSCAP compliance well; Sampled in Spring 2015
MW-47	U	115-155		5 ft below water table	SS030	•									Non OU-1 well; all non OU-1 wells moved from Fall to Spring sampling schedule per BCT Workshop in August 2014; OT069 LTMP well, 5-year review sampling; SS030 PSCAP compliance well; Sampled in Spring 2015
MW-88	U	118-183		middle of water	OT069	•									Non OU-1 well; all non OU-1 wells moved from Fall to Spring sampling schedule per BCT Workshop in August 2014; OT069 LTMP well, 5-year review sampling; Sampled in Spring 2015
MW-99	U	119-134		5ft below water table	SS030	•									Non OU-1 well; all non OU-1 wells moved from Fall to Spring sampling schedule per BCT Workshop in August 2014; SS030 PSCAP compliance well; Sampled in Spring 2015
MW-111	U	107-127		5ft below water table	SS030	•									Non OU-1 well; all non OU-1 wells moved from Fall to Spring sampling schedule per BCT Workshop in August 2014; SS030 PSCAP compliance well; Sampled in Spring 2015
MW-115	U	110-140		5ft below water table	SS030	•									Non OU-1 well; all non OU-1 wells moved from Fall to Spring sampling schedule per BCT Workshop in August 2014; SS030 PSCAP compliance well; Sampled in Spring 2015

Notes:
Fall 2015 Sampling Event includes 144 wells and consists of 144 VOC samples, 12 cations, 12 TDS, 90 chloride, 49 nitrate, 33 sulfate, 45 alkalinity, 89 field tests, and 0 dieldrin samples.
FP - Flood Plain Aquifer
L - Lower Aquifer
TCE - Trichloroethene.
U - Upper Aquifer
VOCs - Volatile organic compounds.
* - April 2015 GW measurement
** - April 2014 GW measurement
*** - Free Product previously detected in well

Wells to be Sampled

EX-1	MW-153	NZ-12
EX-10	MW-154	NZ-126
FT-03	MW-155	NZ-14
FT-04	MW-157	NZ-15
FT-05	MW-158	NZ-16
MW-05	MW-25	NZ-18
MW-10	MW-28	NZ-20
MW-102-OU1	MW-30	NZ-21
MW-103-OU1	MW-31	NZ-22
MW-103-OU2	MW-32	NZ-23
MW-104-OU2	MW-34	NZ-24
MW-105	MW-35	NZ-25
MW-116	MW-36	NZ-27
MW-117	MW-43	NZ-28A
MW-118	MW-44	NZ-30
MW-119	MW-45	NZ-31
MW-120	MW-48	NZ-32
MW-121	MW-52	NZ-33
MW-123	MW-54	NZ-34
MW-124	MW-55	NZ-35
MW-125	MW-57	NZ-36
MW-126	MW-58	NZ-39
MW-127	MW-61	NZ-43
MW-128	MW-65	NZ-49
MW-129	MW-71	NZ-51
MW-130	MW-74	NZ-52
MW-131	MW-75	NZ-54
MW-132	MW-86	NZ-55
MW-133	MW-91	NZ-56
MW-134	NZ-06	NZ-67
MW-136	NZ-07	NZ-68
MW-137	NZ-101	NZ-81
MW-138	NZ-102	NZ-82
MW-139	NZ-103	NZ-83
MW-140	NZ-11	NZ-93
MW-141	NZ-111	NZ-97
MW-144	NZ-116	NZ-99
MW-150	NZ-119	



LEGEND

- Free Product Extraction Well
- Vapor Monitoring Point
- Groundwater Monitoring Well
- Vapor Extraction Well
- Vapor Monitoring Well
- Water Supply Well
- Inactive Supply Well
- Well to be Sampled October 2015
- Topogaphic Contour (ft msl)
- Former George Air Force Base Boundary

0 900 1,800 3,600

Feet

1 inch = 1,800 feet

N

CB&I Federal Services LLC
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Knoxville, TN 37923

FORMER GEORGE AIR FORCE BASE
VICTORVILLE, CALIFORNIA

FIGURE 1

WELLS TO BE SAMPLED
FALL 2015
UPPER AQUIFER

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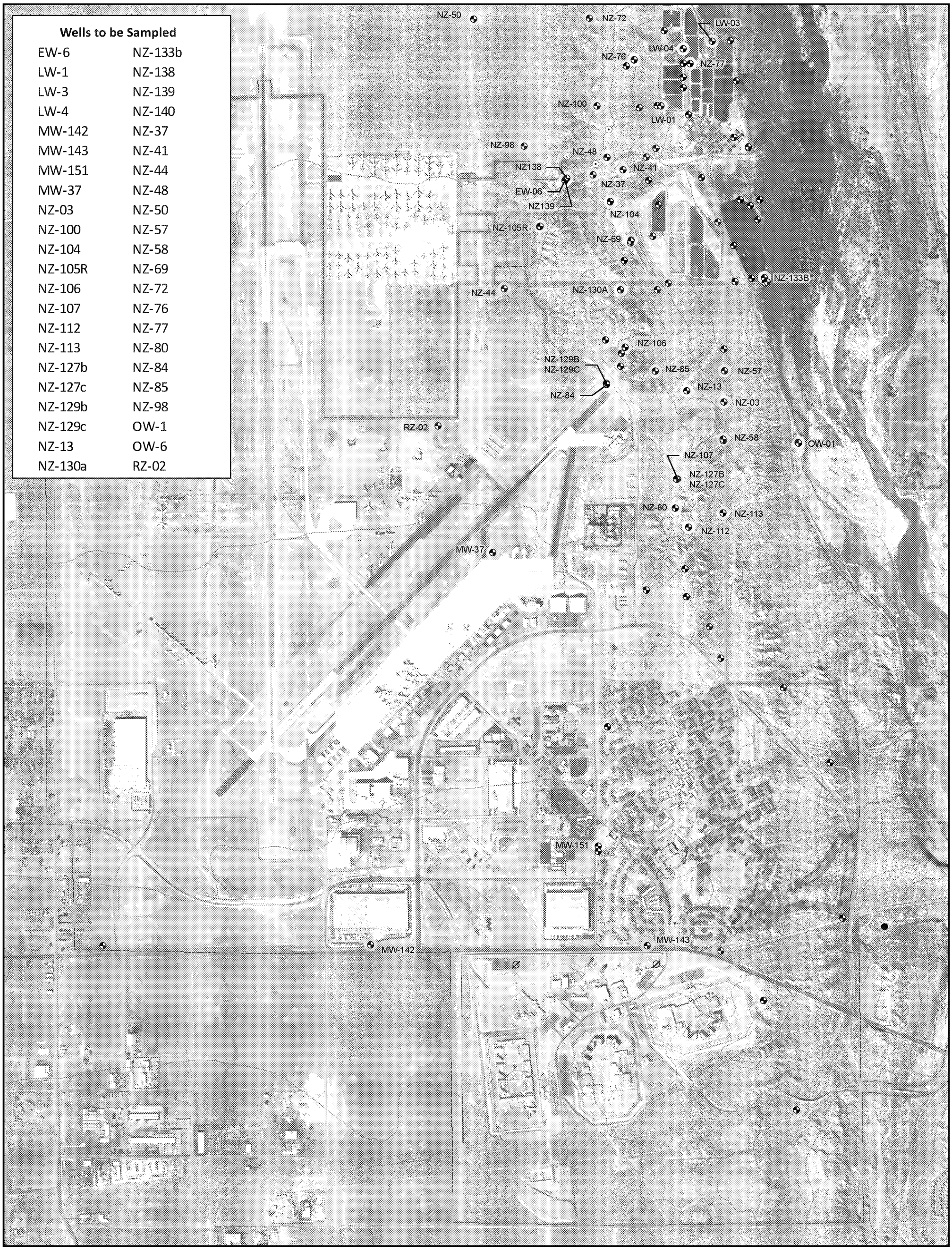
Wells to be Sampled

EW-6	NZ-133b
LW-1	NZ-138
LW-3	NZ-139
LW-4	NZ-140
MW-142	NZ-37
MW-143	NZ-41
MW-151	NZ-44
MW-37	NZ-48
NZ-03	NZ-50
NZ-100	NZ-57
NZ-104	NZ-58
NZ-105R	NZ-69
NZ-106	NZ-72
NZ-107	NZ-76
NZ-112	NZ-77
NZ-113	NZ-80
NZ-127b	NZ-84
NZ-127c	NZ-85
NZ-129b	NZ-98
NZ-129c	OW-1
NZ-13	OW-6
NZ-130a	RZ-02



LEGEND

- Free Product Extraction Well
- Groundwater Monitoring Well
- Water Supply Well
- Inactive Supply Well
- Well to be Sampled October 2015
- Topogaphic Contour (ft msl)
- Former George Air Force Base Boundary

0 900 1,800 3,600

Feet

1 inch = 1,800 feet

N

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FORMER GEORGE AIR FORCE BASE
VICTORVILLE, CALIFORNIA

FIGURE 2

WELLS TO BE SAMPLED
FALL 2015
LOWER AQUIFER

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